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09/319,092	06/18/1999	MICHAEL TEWES	TEWESETAL	2371
7590 03/30/2004			EXAMINER	
COLLARD & ROE 1077 NORTHERN BOULEVARD ROSLYN, NY 11576			LEE, SHUN K	
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			2878	

DATE MAILED: 03/30/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/319,092

Applicant(s)

TEWES ET AL.

Examiner

Shun Lee

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 8/15/03, 8/25/03, 9/26/03, and 12/31/03.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 22-25, 28, 31, 32, 35-40 and 42-49 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 22-25, 28, 31, 32, 35-40 and 42-49 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12/6/02 & 8/15/03 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>0803</u> . | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Information Disclosure Statement***

1. The references AA, AL, AM, AS, AT, AU on pg. 1 and AL on pg. 2 of the information disclosure statement (IDS) submitted on 25 August 2003 were previously considered in a prior IDS. In addition, the references AJ, AK, and AM on pg. 2 of the information disclosure statement (IDS) submitted on 25 August 2003 were previously considered in another prior IDS.

### ***Drawings***

2. The drawings were received on 15 August 2003. These drawings are acceptable.

### ***Claim Objections***

3. Claims 22-25, 28, 31, 32, 38, and 40 are objected to because of the following informalities:

- (a) in claim 22, "at least one of said plurality of detectors" on lines 12-13 should probably be --said at least one detector--;
- (b) in claim 22, "said pinhole" on line 14 should probably be --said at least one pinhole--;
- (c) in claim 22, "for focusing the beam between said first and said at least a second dichroic beam splitter" on lines 23-24 should probably be --at which the focus of the beam is located--;
- (d) in claim 23, "said coupling connection" on line 2 should probably be --said optical connection-- (see line 2 of claim 22);

- (e) in claim 24, "said coupling connection" on line 2 should probably be --said optical connection-- (see line 2 of claim 22);
- (f) in claim 25, "a beam path" on line 3 should probably be --an excitation beam path-- (see "a beam path" in line 20 of claim 22);
- (g) in claim 28, "said at least one filter from said filter array" on lines 3-4 (there is insufficient antecedent basis for this limitation in the claim) should probably be --at least one filter from a filter array--;
- (h) in claim 31, "said at least one optical unit" on line 2 should probably be --said optical unit--;
- (i) in claim 32, "said at least one mirror" on line 4 (there is insufficient antecedent basis for this limitation in the claim) should probably be --at least one mirror--;
- (j) in claim 32, "said at least one optical unit" on lines 4-5 should probably be --said optical unit--;
- (k) in claim 38, "further comprising a filter array comprising at least one filter" on lines 2-3 should probably be --said at least one filter--;
- (l) in claim 38, "and are coupled to said support housing" on lines 5-6 should probably be deleted (see claim 28); and
- (m) in claim 40, "wherein said at least one filter is formed as a" on line 7 (there is insufficient antecedent basis for this limitation in the claim) should probably be --wherein at least one filter is formed as a--.

Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 44, 45, 48, and 49 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

It should be noted that newly added claim limitations must be supported in the specification through express, implicit, or inherent disclosure (MPEP § 2162). Newly added independent claim 44 recites the limitation of "only one pinhole is disposed only along the emission light and not along the stimulation light" which was not described in the specification. Further, the absence of elements in the drawing does not explicitly support the necessity of their absence. Therefore, the newly added claim limitations fail to be supported in the specification through express, implicit, or inherent disclosure.

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of

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the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims 22-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jacobsen (US 5,329,352) in view of Engelhart *et al.* (WO 96/06377 with corresponding US 5,903,688) and Qian *et al.* (Applied Optics 30:1185-1195, April 1991).

In regard to claims **22-24**, Jacobsen discloses (Figs. 1-3) an apparatus comprising:

- (a) a support body (21, 31);
- (b) a pinhole array (8) comprising at least one pinhole (8) coupled to said support body (21, 31);
- (c) at least one detector (11) coupled to said support body (21, 31);
- (d) a lens array (10) comprising at least one lens (10), coupled to said support body (21, 31), and positioned between at least one pinhole (8) in said pinhole array (8) and at least one of said plurality of detectors (18), said lens array (10) for focusing an emission light passing through said pinhole (8) and onto said at least one detector (11); and
- (e) a plurality of dichroic beam splitters comprising a first dichroic beam splitter (7) and at least a second dichroic beam splitter (9) coupled to said support body (21,

31) in a beam path and wherein at least one pinhole (8) from said pinhole array (8) is disposed between said first dichroic beam splitter (7) and said at least a second dichroic beam splitter (9) for focusing the beam between said first (7) and said at least a second (9) dichroic beam splitters.

While Jacobsen also discloses (column 4, lines 32-47) that the apparatus comprises a commercial confocal laser scanning microscope (CLSM) wherein the stimulating light is supplied by a laser (1), the apparatus of Jacobsen lacks an explicit description of a fiber optic waveguide disposed within a coupling connection coupled to the support body for coupling in a stimulating light and that the support is a fluorescence correlation spectroscopy module arrayed in an optical inlet and outlet of a microscope. However, commercially available confocal laser scanning microscopes are well known in the art. For example, Engelhart *et al.* teach (column 1, lines 34-42; Fig.) to couple a laser (1) to a microscope via an optical module (8) having an optical fiber (4) to isolate the laser (1) from the microscope. Qian *et al.* teach (second paragraph on pg. 1186) it is known in the art that "Most FCS and FPR experiments are carried out on a standard epifluorescence microscope which is coupled to a laser in a confocal geometry". Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to provide a fiber optic waveguide coupling connection coupled to the support body for mounting to the optical inlet and outlet of the commercially available microscope in the apparatus of Jacobsen, in order to couple elements (such as the laser which provides the stimulating light) to the microscope while isolating the elements from the microscope and that the apparatus of Jacobsen is useful for obtaining

fluorescence data in well known fluorescence experiments such as FCS (*i.e.*, fluorescence correlation spectroscopy).

9. Claims 25 and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jacobsen (US 5,329,352) in view of Engelhart *et al.* (WO 96/06377 with corresponding US 5,903,688) and Qian *et al.* (Applied Optics 30:1185-1195, April 1991) as applied to claim 22 above, and further in view of Chande (US 4,844,574).

In regard to claim **25** which is dependent on claim 22, the modified apparatus of Jacobsen lacks a collimator for generating a parallel light beam that is disposed within said support body in a beam path after said coupling connection. Chande teaches (column 3, lines 19-25; Fig. 1) to provide a collimator (108) in order to intercept the fiber emitted beam (column 3, lines 19-25). Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to provide a collimator in the modified apparatus of Jacobsen, in order to intercept and collect the fiber emitted beam as taught by Chande.

In regard to claim **39** which is dependent on claim 22, the modified apparatus of Jacobsen lacks a collimator is tuned to the numerical aperture of the fiber optical waveguide. Chande teaches that the focal length ( $f_1$ ) and clear aperture (*i.e.*, parallel light beam diameter  $D_1$ ) of the collimator (108) must be selected in order to intercept the fiber emitted beam (column 3, lines 19-25). It is noted that the numerical aperture is defined as the sine of half the acceptance angle (*i.e.*, see  $\theta_{EM}$  in Fig. 1 of Chande). Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to match the focal length and clear aperture (*i.e.*, numerical aperture) of



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the collimator to the emitted beam angle (*i.e.*, numerical aperture) of the fiber in the modified apparatus of Jacobsen, in order to intercept and collect the fiber emitted beam as taught by Chande.

10. Claims 28, 31, 32, 35, 37, and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jacobsen (US 5,329,352) in view of Engelhart *et al.* (WO 96/06377 with corresponding US 5,903,688) and Qian *et al.* (Applied Optics 30:1185-1195, April 1991) as applied to claim 22 above, and further in view of Schalz (US 5,585,964) and Jörgens (US 5,535,052).

In regard to claim **28** which is dependent on claim 22, the modified apparatus of Jacobsen lacks a filter array (*e.g.*, at least two frequency selective filter devices) and the beam splitter are set on a receptacle holder removably inserted within the support body. Schalz teaches that holding elements (*i.e.*, sliders, carriers, or slide-in-modules; see column 2, lines 36-54) have “ ... corresponding precision-stop-surfaces ... for the exact positioning of the holding element ... ” (see also column 4, lines 21-23) and that these holding elements are designed to contain optical elements such as fluorescence-dividing cubes with switching positions (column 2, lines 60-67). Jörgens teaches (column 5, lines 47-53) that filter, beam splitters, and/or mirrors are used to provide a plurality of confocal detection channels. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to provide beam splitters with associated filters in a removably inserted common receptacle holder (*i.e.*, sliding mechanism) in the modified apparatus of Jacobsen, in order to select particular

combinations of beam splitter with associated filters so as to obtain a desired range of wavelengths in each of a plurality of confocal detection channels.

In regard to claims **31** and **32** which are dependent on claim 28, the modified apparatus of Jacobsen lacks at least one mirror. Jörgens teaches (column 5, lines 47-53) that filter, beam splitters, and/or mirrors are used to provide a plurality of confocal detection channels. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to provide at least one mirror in the modified apparatus of Jacobsen, in order to obtain a plurality of confocal detection channels.

In regard to claim **35** which is dependent on claim 28, the modified apparatus of Jacobsen lacks a detailed description of the receptacle holder (*i.e.*, slider), characterized in that the support body (4) for receiving the receptacle holder (15) is provided with shaped surfaces (25), to which the receptacle holder (15) provided with complementarily shaped surfaces arrayed on the support body in the beam path can be fixed. Schalz teaches that holding elements (*i.e.*, sliders, carriers, or slide-in-modules; see column 2, lines 36-54) have “ ... corresponding precision-stop-surfaces ... for the exact positioning of the holding element ... ” (see also column 4, lines 21-23) and that these holding elements are designed to contain optical elements such as fluorescence-dividing cubes with switching positions (column 2, lines 60-67). Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to provide corresponding precision-stop-surfaces in the sliders of the modified apparatus of Jacobsen, in order to have exact positioning and alignment of the optical elements in the sliders as taught by Schalz.

In regard to claim **37** which is dependent on claim 28, the modified apparatus of Jacobsen lacks that the support body is made with cavities for receiving the receptacle holder, wherein the said cavities have suitable lateral surfaces designed to accommodate the oriented reception of the receptacle holder. Schalz teaches that a carrier (*i.e.*, receptacle holder) has corresponding precision-stop-surfaces (*e.g.*, lateral surfaces of a cavity) for exact positioning (column 2, lines 46-59) without additional alignment or optical adjustment (column 6, lines 29-40). Therefore it would have been obvious to one having ordinary skill in the art to provide cavities with corresponding precision-stop-surfaces in the modified apparatus of Jacobsen, in order to have exact positioning without additional alignment or optical adjustment as taught by Schalz.

In regard to claim **38** which is dependent on claim 37, Schalz and Jörgens is applied as in claims 28, 31, 32, and 35 above.

11. Claim 36 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jacobsen (US 5,329,352) in view of Engelhart *et al.* (WO 96/06377 with corresponding US 5,903,688) and Qian *et al.* (Applied Optics 30:1185-1195, April 1991) as applied to claim 22 above, and further in view of Schalz (US 5,585,964).

In regard to claim **36** which is dependent on claim 22, the modified apparatus of Jacobsen lacks an explicit description of a connection flange for attaching the support body to the connection of the microscope and a support body which is made in one piece from a metallic material. Schalz teaches (column 4, lines 1-25) that modularly designed microscopes should be manufactured of metal such as aluminum or brass in a one-piece construction-type in order to increase rigidity. Schalz also teaches (column 6,

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lines 29-40) that a modular microscope system makes it possible to attach modules (*i.e.*, support body) via precision attachment surfaces (*e.g.*, connection flange) without additional alignment or optical adjustment. Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to manufacture the modules in the modified apparatus of Jacobsen as a metallic one-piece construction-type that can be attached to a precision attachment surface of a modular microscope, in order to have rigid module that can be attached to a microscope without additional alignment or optical adjustment as taught by Schalz.

12. Claim 40 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jacobsen (US 5,329,352) in view of Engelhart *et al.* (WO 96/06377 with corresponding US 5,903,688), Qian *et al.* (Applied Optics 30:1185-1195, April 1991), and Chande (US 4,844,574) as applied to claim 39 above, and further in view of Schalz (US 5,585,964) and Jörgens (US 5,535,052).

In regard to claim **40** which is dependent on claim 39, Schalz and Jörgens is applied as in claims 28, 31, 32, 35, 37, and 38 above.

13. Claims 42, 43, 46, and 47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jacobsen (US 5,329,352) in view of Engelhart *et al.* (WO 96/06377 with corresponding US 5,903,688), Qian *et al.* (Applied Optics 30:1185-1195, April 1991), Schalz (US 5,585,964), and Jörgens (US 5,535,052).

In regard to claim **42**, Jacobsen in view of Engelhart *et al.* and Qian *et al.* is applied as in claims 22-24 above. Schalz and Jörgens is applied as in claims 28, 31,

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32, 35, 37, and 38 above. Jacobsen also discloses (Figs. 1-3) that the beams passes through or reflect from the plurality of beamsplitters (7, 9).

In regard to claim **43**, Jacobsen in view of Schalz, Engelhart *et al.*, Qian *et al.*, and Jörgens is applied as in claim 42 above. The apparatus of Jacobsen lacks that each of the optical components and said at least one mirror can be removed from the support body and inserted in a different order in a different one of said plurality of cavities or rotated 180° and reinserted. Schalz teaches (column 5, lines 8-20) a fluorescence-divider turret (31 in Figs 1a and 1b) inserted as a slide in module. Therefore it would have been obvious to one having ordinary skill in the art to provide a fluorescence-divider turret in the apparatus of Jacobsen, in order to select a particular combination of beam splitter with associated filters (*i.e.*, a particular fluorescence-divider) by sliding in the (*e.g.*, 180°) rotated fluorescence-divider turret module so as to obtain a desired range of wavelengths in the confocal detection channel.

In regard to claim **46**, Jacobsen in view of Schalz, Engelhart *et al.*, Qian *et al.*, and Jörgens is applied as in claim 42 above. Jacobsen also discloses (Figs. 1-3) that the focal point of said emission light is after said beam splitter (7) and a focal point of said stimulation light is before said beam splitter (7).

In regard to claim **47**, Jacobsen in view of Schalz, Engelhart *et al.*, Qian *et al.*, and Jörgens is applied as in claim 42 above. Jacobsen also discloses (Figs. 1-3) that a focal point of said stimulation light is before said beam splitter (7).

***Response to Arguments***

14. Applicant's arguments with respect to claims have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

15. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shun Lee whose telephone number is (571) 272-2439. The examiner can normally be reached on Monday-Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Porta can be reached on (571) 272-2444. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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